

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JAMES F. BELCHER,
HOWARD R. BERATAN, and PAUL O. JOHNSON

Appeal No. 1998-1667
Application No. 08/224,211

ON BRIEF

Before GARRIS, WALTZ, and DELMENDO, Administrative Patent Judges.

WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 3. The remaining claims pending in this application are claims 4 through 9 and 11. Claim 11 stands allowed by the examiner

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while claims 4 through 9 are objected to by the examiner as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims (see the Final Rejection dated Aug. 29, 1996, Paper No. 8, page 4; and the Brief, pages 1-2).

According to appellants, the invention is directed to a method of polishing a ferroelectric material using a specified acidic polishing solution and an external polishing member (Brief, page 2). A copy of illustrative claim 1 is attached as an Appendix to this decision.

The examiner has relied upon the following references as evidence of obviousness:

Maniar	5,258,093	Nov. 2, 1993
Sandhu et al. (Sandhu)	5,318,927	Jun. 7, 1994
(U.S. filing date of Apr. 29, 1993)		

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Sandhu and Maniar (Answer, page 3). We reverse this ground of rejection for reasons which follow.

OPINION

The examiner finds that Sandhu discloses a method of polishing a ferroelectric material by use of an aqueous acidic

or basic solution "and polishing the surface with a polishing member." (Answer, sentence bridging pages 3-4). However, the examiner later admits that Sandhu does not explicitly state that the polishing member is used with the polishing solution (Answer, page 5). The examiner's position apparently is that Sandhu discloses use of chemical-mechanical polishing (CMP) and the use of an external polishing member is conventional in CMP (Answer, pages 4-5). The examiner also notes that appellants' specification discloses application of the polish to the surface with "a polishing wheel or the like in standard manner," further supporting the examiner's position that conventional polishing methods can be used for applying the acidic polish recited in the claims on appeal (Answer, page 5, citing the specification, page 3, ll. 21-23).

Appellants argue that the allegation by the examiner that CMP conventionally uses an external polishing member is contrary to the disclosure of Sandhu (Brief, page 3). Appellants submit that the polishing takes place in Sandhu as a result of the particulate in the cleaning solution and no actual external polishing member is taught or suggested by any of the applied references (*id.*). We agree.

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The examiner has agreed that Sandhu does not explicitly disclose or teach the use of an external polishing member (Answer, page 5). The examiner has not submitted any convincing evidence and/or reasoning to support the contention that it is conventional in the CMP art to use an external polishing member.¹ Regardless, from the disclosure of Sandhu as a whole, we determine that the mechanical aspect of the CMP in this reference was achieved by the use of solid polishing particulates. See Sandhu at col. 3, ll. 17-23:

The chlorides and sulfates are removed by chemical-mechanical polishing action in the same polishing treatment. Such removal action might result in the chemical aspect of the chemical-mechanical polishing predominating, or in the mechanical aspect from interaction with the slurry particles predominating. (Emphasis added).

Sandhu also teaches, at col. 4, ll. 40-42:

The formed BaO and SrO material would then be removed by the mechanical polishing and/or chemical

¹We note that Cadien et al., U.S. Patent No. 5,516,346, with an apparent filing date for the parent application of Nov. 3, 1993, was cited in the Advisory Action dated Nov. 19, 1996, Paper No. 10, to show that CMP conventionally occurs with a polishing pad but was specifically *not* relied upon in the rejection in the examiner's Answer (Answer, page 7). Therefore we do not consider this reference as evidence of obviousness in the rejection in this appeal. See *In re Hoch*, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970).

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action of the chemical-mechanical polishing step.
(Emphasis added).

Finally, Sandhu teaches, at col. 8, ll. 10-12:

 This is anticipated to result in formation of only
very thin layers of the reactant product which would
be removed by the mechanical actions of the slurry.
 (Emphasis added).

From these teachings of Sandhu, we determine that it is clear that the mechanical action of the CMP technique of Sandhu is a result of the solid polishing particles used in the slurry and there is no disclosure, teaching or suggestion of the need for any external polishing member. Thus, even assuming *arguendo* that CMP conventionally employs an external polishing member with a polishing solution, the particular CMP technique of Sandhu does not disclose or suggest use of such an external polishing member.

The examiner states that "Maniar is not relied upon to teach conventional polishing techniques." Answer, page 5. Maniar has only been relied upon for teaching a method of etching a ferroelectric material with an etchant comprising *both* an acid and an oxidizing agent (in water) with the advantages of etching uniformly with removal of chemical residues simultaneously with the dielectric film (Answer, page

4). Therefore, Maniar does not remedy the deficiency in Sandhu discussed above.

Additionally, the examiner's proposed combination of Sandhu and Maniar does not disclose or teach all of the claimed subject matter, namely use of an overall polish solution that is "acidic" (see claim 1, part (b), line 1; see also the Brief, page 4). The examiner states that "since the solution is the same as that cited it is expected to be acidic." Answer, page 6. However, the examiner has not shown that the solution of Maniar is the same as that recited in the claims, only that the *components* of that solution may be the same or similar. See Maniar, col. 5, ll. 20-34, where the amounts of the acidic components (nitric acid and hydrofluoric acid) and basic component (hydrogen peroxide) *could* be used in amounts that would result in a basic or acidic solution. The only teachings presented in Maniar are the "preferred" and "most preferred" embodiments along with the examples, all of which show large amounts of the basic component and small amounts of the acidic components (see col. 5, ll. 20-34 and Table I in col. 7). Therefore, the only teachings in this record would have led one of ordinary skill in the art to

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basic overall polishing solutions. The examiner has not presented any convincing evidence and/or reasoning to show that one of ordinary skill in the art would have used an overall acidic polishing solution.

For the foregoing reasons, we determine that the examiner has not met the initial burden of establishing a *prima facie* case of obviousness. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Accordingly, we cannot sustain the examiner's rejection of claims 1-3 under 35 U.S.C. § 103 as unpatentable over Sandhu and Maniar.

The decision of the examiner is reversed.

REVERSED

	Bradley R. Garris)	
	Administrative Patent Judge)	
)	
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)	
	Thomas A. Waltz)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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)	
	Romulo H. Delmendo)	
	Administrative Patent Judge)	

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APPENDIX

1. A method of polishing a ferroelectric material comprising the steps of:

(a) providing a ferroelectric surface to be polished;

(b) applying an acidic polish solution to said surface containing from a finite amount greater than zero to about 80% by volume of an acid taken from the class consisting of organic acids, mineral acids, reducing acids and oxidizing acids and combinations thereof, from a finite amount greater than zero to about 80% by volume of a strong oxidizing agent and the remainder water; and

(c) polishing said surface with a polishing member disposed external to and not a part of said polish solution while said polish solution is on said surface.